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Presenter: Kyle McDonald

Preference: oral

Presenter is a non-member

1st Choice: 63 2nd Choice: 38

(Special session on the BOREAS experiment, if one is being organized)

MCDONALD, KYLE, JOBEA WAY, REINIER ZIMMERMAN and ERIC RIGNOT.

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Application of imaging radar to monitor growing season duration at BOREAS.

Improved estimates of the seasonal duration of carbon exchange processes in boreal regions may improve current estimates of net annual CO₂ flux at high latitudes. For coniferous tree species, the summer frost-free period bounds growing season length and period of carbon intake. For the broader landscape, the spring soil thaw bounds the period of soil respiration and carbon release. In addressing the use of imaging radar as a tool for estimating periods of carbon exchange, one must understand (1) the relationship between canopy freeze/thaw state and the period of photosynthetic and respiration activity and (2) the sensitivity of radar to vegetation and soil freeze/thaw processes. We deployed several suites of measurement systems to monitor in situ soil and vegetation temperature, xylem sap flux, vegetation dielectric constant, and within-canopy meteorologic variables at the Boreal Ecosystem Atmosphere Study (BOREAS) in Canada. Imaging radar observations were obtained with the ERS-1 SAR throughout 1994. These data were supplemented with CO₂ flux determined from models and tower-based measurements. Results show that changes in radar backscatter were well correlated with the start of both soil respiration and vegetation CO₂ intake, and demonstrate radar's utility for providing useful input to CO₂ flux estimates.